

1449 VOL-33

1-21

Library of the Museum

OF

COMPARATIVE ZOOLOGY,

AT HARVARD COLLEGE, CAMBRIDGE, MASS.

Founded by private subscription, in 1861.

~~~~~

Deposited by ALEX. AGASSIZ.

No. 7527  
Jan. 23 - July 30, 1892





260.1  
JAN 23 1892

New Series, No. CXXIX (Vol. XXXIII, Part 1).

Price 10s.

7527.

DECEMBER, 1891.

1449

THE

1-21

# THE QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

*Honorary Fellow of Exeter College, Oxford.*

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

*Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London;*

ADAM SEDGWICK, M.A., F.R.S.,

*Fellow and Assistant-Lecturer of Trinity College, Cambridge;*

AND

A. MILNES MARSHALL, M.A., D.Sc., M.D., F.R.S.,

*Late Fellow of St. John's College, Cambridge; Professor in the Victoria University; Beyer Professor of Zoology in the Owens College, Manchester.*

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.



LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCXCII.

CONTENTS OF No. CXXIX.—New Series.

MEMOIRS:

|                                                                                                                                                                                                                                | PAGE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Some Problems of Reproduction: a Comparative Study of Gametogeny and Protoplasmic Senescence and Rejuvenescence. By MARCUS M. HARTOG, M.A., D.Sc., F.L.S., Professor of Natural History in the Queen's College, Cork . . . . . | 1    |
| On Wandering Cells in Echinoderms, &c., more especially with regard to Excretory Functions. By HERBERT E. DURHAM, M.A., King's College, Cambridge, and Guy's Hospital, London. (With Plate I) . . . . .                        | 81   |
| On the Nature of the Excretory Processes in Marine Polyzoa. By SIDNEY F. HARMER, M.A., B.Sc., Fellow and Assistant Tutor of King's College, Cambridge. (With Plates II and III) . . . . .                                      | 123  |
| Spermatogenesis in <i>Myxine glutinosa</i> . By J. T. CUNNINGHAM, M.A., Naturalist on the Staff of the Laboratory of the Marine Biological Association, Plymouth. (With Plate IV) . . . . .                                    | 169  |
| Notes on some Aquatic Oligochaeta. By W. BLAXLAND BENHAM, D.Sc.Lond., Aldrichian Demonstrator of Comparative Anatomy, Oxford. (With Plates V, VI, and VII) . . . . .                                                           | 187  |
| On the Differentiation of Leprosy and Tubercl Bacilli. By CHARLES SLATER, M.B.Cantab. . . . .                                                                                                                                  | 219  |
| On a Specimen of the True Teeth of <i>Ornithorhynchus</i> . By Professor CHARLES STEWART, P.L.S. (With Plate VIII) . . . . .                                                                                                   | 229  |

260.3  
MAP 16 1892

New Series, No. CXXX (Vol. XXXIII, Part 2).

Price 10s.

7527.

JANUARY, 1892.

THE  
QUARTERLY JOURNAL  
OF  
MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

*Linacre Professor of Human and Comparative Anatomy, Fellow of Merton College, and  
Honorary Fellow of Exeter College, Oxford.*

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

*Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital,  
London;*

ADAM SEDGWICK, M.A., F.R.S.,

*Fellow and Assistant-Lecturer of Trinity College, Cambridge;*

AND

A. MILNES MARSHALL, M.A., D.Sc., M.D., F.R.S.,

*Late Fellow of St. John's College, Cambridge; Professor in the Victoria University; Beyer Professor of Zoology  
in the Owens College, Manchester.*

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.



LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCXCII.

## CONTENTS OF No. CXXX.—New Series.

### MEMOIRS:

|                                                                                                                                                                                                                                                                                                                    | PAGE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| On <i>Onchonesoma Steenstrupii</i> . By ARTHUR E. SHIPLEY, M.A.,<br>F.L.S., Fellow and Lecturer of Christ's College, Cambridge, and<br>Demonstrator of Comparative Anatomy in the University. (With<br>Plate IX) . . . . .                                                                                         | 233  |
| Note on a Sieve-like Membrane across the Oscula of a Species of<br><i>Leucosolenia</i> , with some Observations on the Histology of the<br>Sponge. By EDWARD A. MINCHIN, Assistant to the Linacre Pro-<br>fessor of Human and Comparative Anatomy in the University of<br>Oxford. (With Plates X and XI) . . . . . | 251  |
| The Development of the Oviduct in the Frog. By ERNEST W.<br>MACBRIDE, B.A.Cantab., B.Sc.Lond., Scholar of St. John's College,<br>and Scholar of the University of London. (With Plates XII and<br>XIII) . . . . .                                                                                                  | 273  |
| On the Nauplius Eye persisting in some Decapods. By MARGARET<br>ROBINSON, University College, London. (With Plate XIV) . .                                                                                                                                                                                         | 283  |
| Notes on Two Acanthodriloid Earthworms from New Zealand. By<br>W. BLAXLAND BENHAM, D.Sc.Lond., Aldrichian Demonstrator of<br>Anatomy in the University of Oxford. (With Plates XV and XVI) .                                                                                                                       | 289  |
| On a New Genus of Synascidians from Japan. By ASAJIRO OKA,<br>of the Imperial University of Tokio, and ARTHUR WILLEY, B.Sc.<br>Lond. (With Plates XVII and XVIII) . . . . .                                                                                                                                        | 313  |

APR 26 1892

265.3

New Series, No. CXXXI (Vol. XXXIII, Part 3).

Price 10s.

7527

MARCH, 1892.



THE  
QUARTERLY JOURNAL  
OF  
MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

*Linacre Professor of Human and Comparative Anatomy, Fellow of Merton College, and  
Honorary Fellow of Exeter College, Oxford.*

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

*Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital,  
London;*

ADAM SEDGWICK, M.A., F.R.S.,

*Fellow and Assistant-Lecturer of Trinity College, Cambridge;*

AND

A. MILNES MARSHALL, M.A., D.Sc., M.D., F.R.S.,

*Late Fellow of St. John's College, Cambridge; Professor in the Victoria University; Beyer Professor of Zoology  
in the Owens College, Manchester.*

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.



LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCXCII.

CONTENTS OF No. CXXXI.—New Series.

MEMOIRS:

|                                                                                                                                                                                                                                                                                     | PAGE |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| A New Branchiate Oligochaete ( <i>Branchiura Sowerbyi</i> ). By FRANK E. BEDDARD, M.A., Prosector to the Zoological Society of London, Lecturer on Biology at Guy's Hospital. (With Plate XIX) . . . . .                                                                            | 325  |
| The Formation of the Germ-layers in <i>Crangon vulgaris</i> . By W. F. R. WELDON, M.A., F.R.S., Fellow of St. John's College, Cambridge; Jodrell Professor of Zoology in University College, London. (With Plates XX, XXI, and XXII) . . . . .                                      | 343  |
| The Pigment Cells of the Retina. By J. S. BODEN and F. C. SPRAWSON, Students of Medicine, King's College, London . . . . .                                                                                                                                                          | 365  |
| Observations upon the Development of the Segmentation Cavity, the Archenteron, the Germinal Layers, and the Amnion in Mammals. By ARTHUR ROBINSON, M.D., Senior Demonstrator of Anatomy at the Owens College, Manchester. (With Plates XXIII, XXIV, XXV, XXVI, and XXVII) . . . . . | 369  |

New Series, No. CXXXII (Vol. XXXIII, Part 4).

Price 10s.

4527  
July 30, 1892. JUNE, 1892.

THE

# QUARTERLY JOURNAL

OF

# MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

*Linacre Professor of Human and Comparative Anatomy, Fellow of Merton College, and Honorary Fellow of Exeter College, Oxford.*

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

*Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London;*

ADAM SEDGWICK, M.A., F.R.S.,

*Fellow and Lecturer of Trinity College, Cambridge;*

AND

A. MILNES MARSHALL, M.A., D.Sc., M.D., F.R.S.,

*Late Fellow of St. John's College, Cambridge; Professor in the Victoria University; Beyer Professor of Zoology in the Owens College, Manchester.*

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.



L O N D O N :

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

M D C C C X C I I .

## CONTENTS OF No. CXXXII.—New Series.

### MEMOIRS:

|                                                                                                                                                                                                                                                        | PAGE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Primitive Segmentation of the Vertebrate Brain. By BERTRAM H. WATERS, A.B., E. M. Fellow in Biology. (With Plate XXVIII)                                                                                                                               | 457  |
| The Oscula and Anatomy of <i>Leucosolenia clathrus</i> , O. S. By E. A. MINCHIN, B.A., Assistant to the Linacre Professor of Human and Comparative Anatomy, Oxford. (With Plate XXIX)                                                                  | 477  |
| Researches into the Embryology of the Oligochaeta. No. I.—On Certain Points in the Development of <i>Acanthodrilus multiporus</i> . By FRANK E. BEDDARD, M.A., F.R.S., Prosector of the Zoological Society of London. (With Plates XXX and XXXI)       | 497  |
| On the Innervation of the Cerata of some Nudibranchiata. By W. A. HERDMAN, D.Sc., F.R.S., Professor of Natural History; and J. A. CLUBB, Assistant in the Zoological Laboratory, University College, Liverpool. (With Plates XXXII, XXXIII, and XXXIV) | 541  |
| Notes on Elasmobranch Development. By ADAM SEDGWICK, M.A., F.R.S., Fellow and Lecturer of Trinity College, Cambridge. (With Plate XXXV)                                                                                                                | 559  |
| On the Paired Nephridia of Prosobranchs, the Homologies of the only remaining Nephridium of most Prosobranchs, and the Relations of the Nephridia to the Gonad and Genital Duct. By DR. R. V. ERLANGER. (With Plates XXXVI and XXXVII)                 | 587  |

TITLE, CONTENTS, AND INDEX.

205

Fig. 1.

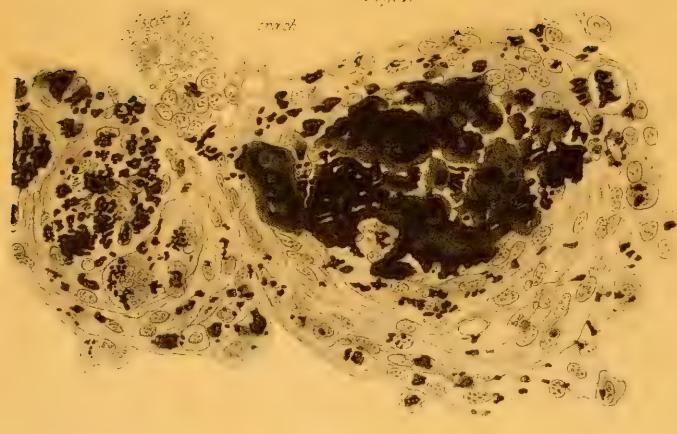


Fig. 2.

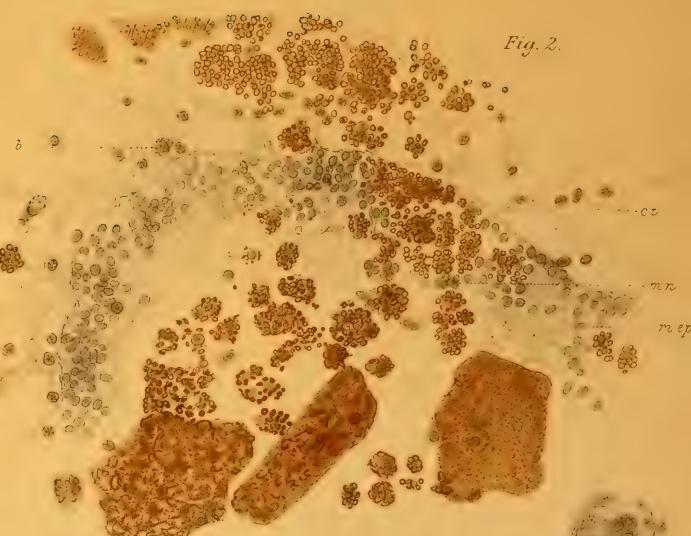


Fig. 4.



Fig. 3.



Fig. 5.



Fig. 6

Fig. 7.

206



Fig. 1.



Fig. 2.

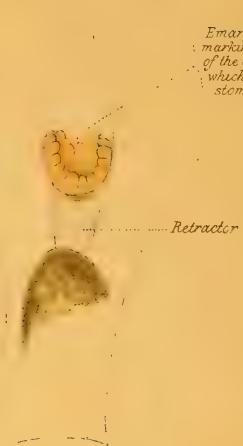


Fig. 3.

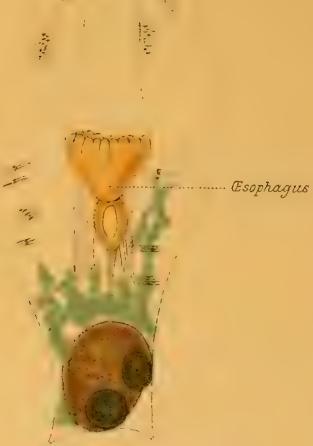


Fig. 4.



Fig. 5.

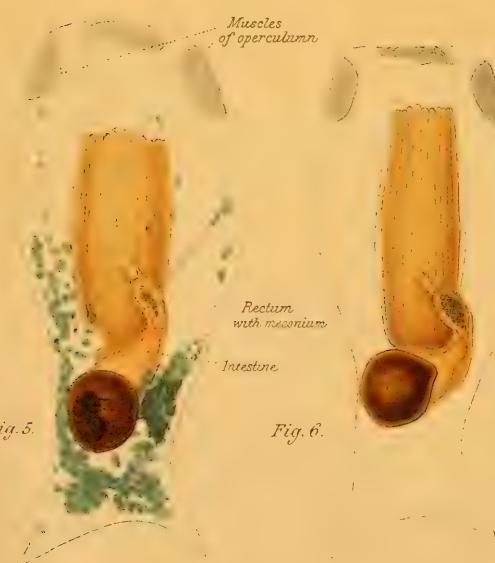


Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.





Fig. 10.



Fig. 11.



Fig. 16.



Fig. 17.



Fig. 18.



Fig. 20.



Fig. 19.



Fig. 23.



Fig. 24.



Fig. 21.



Fig. 22.



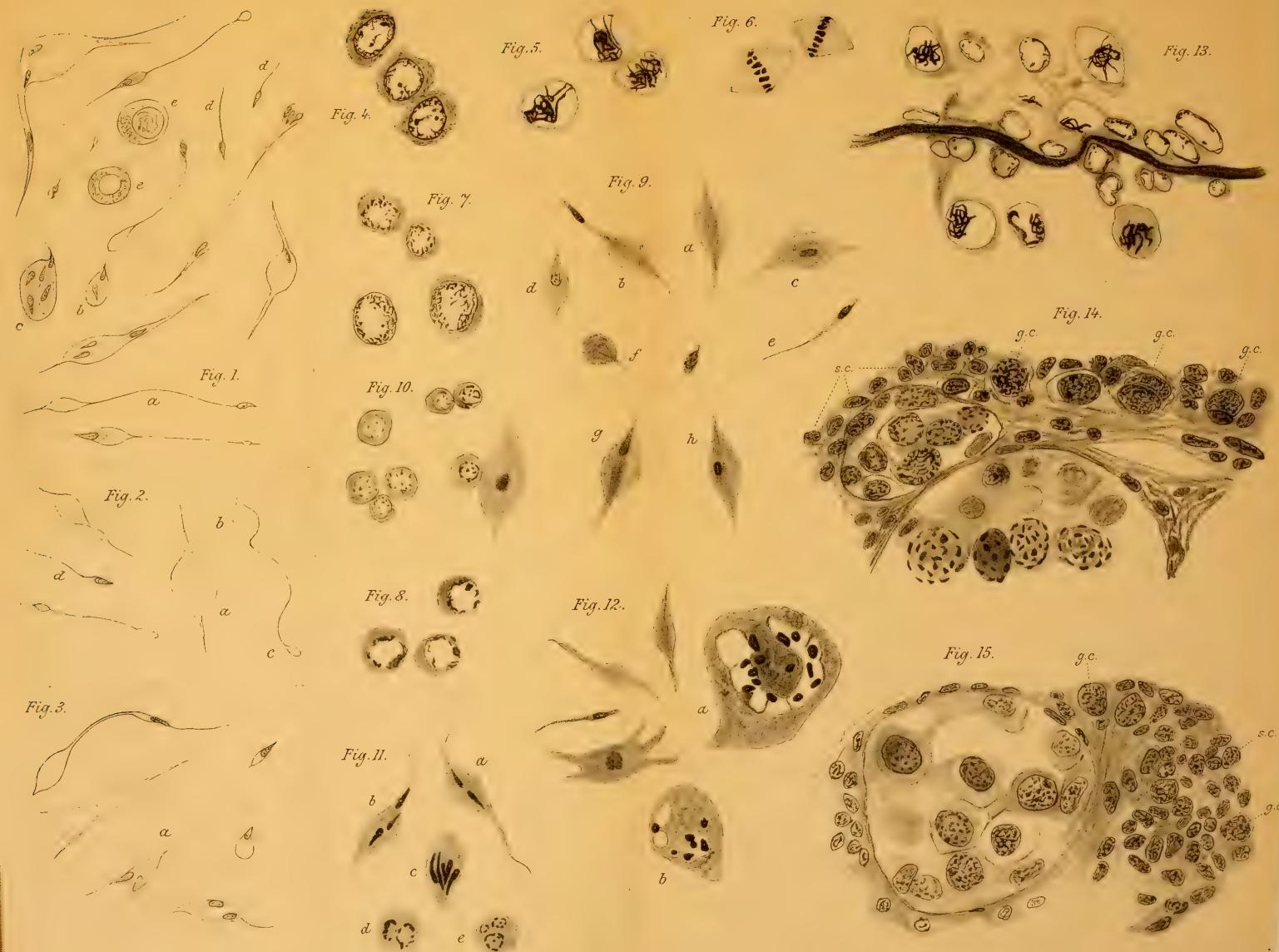
Fig. 15.



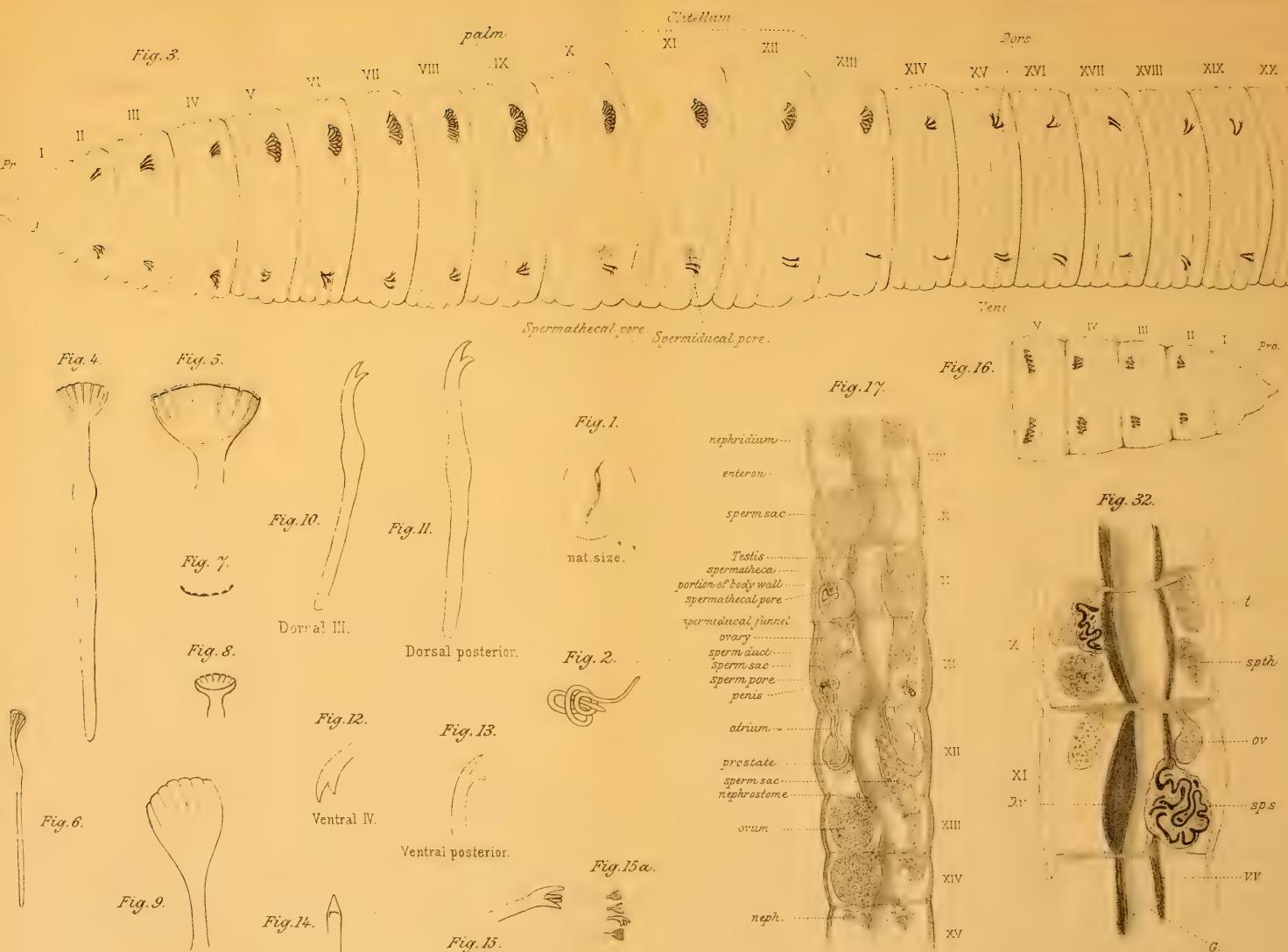
Fig. 13.













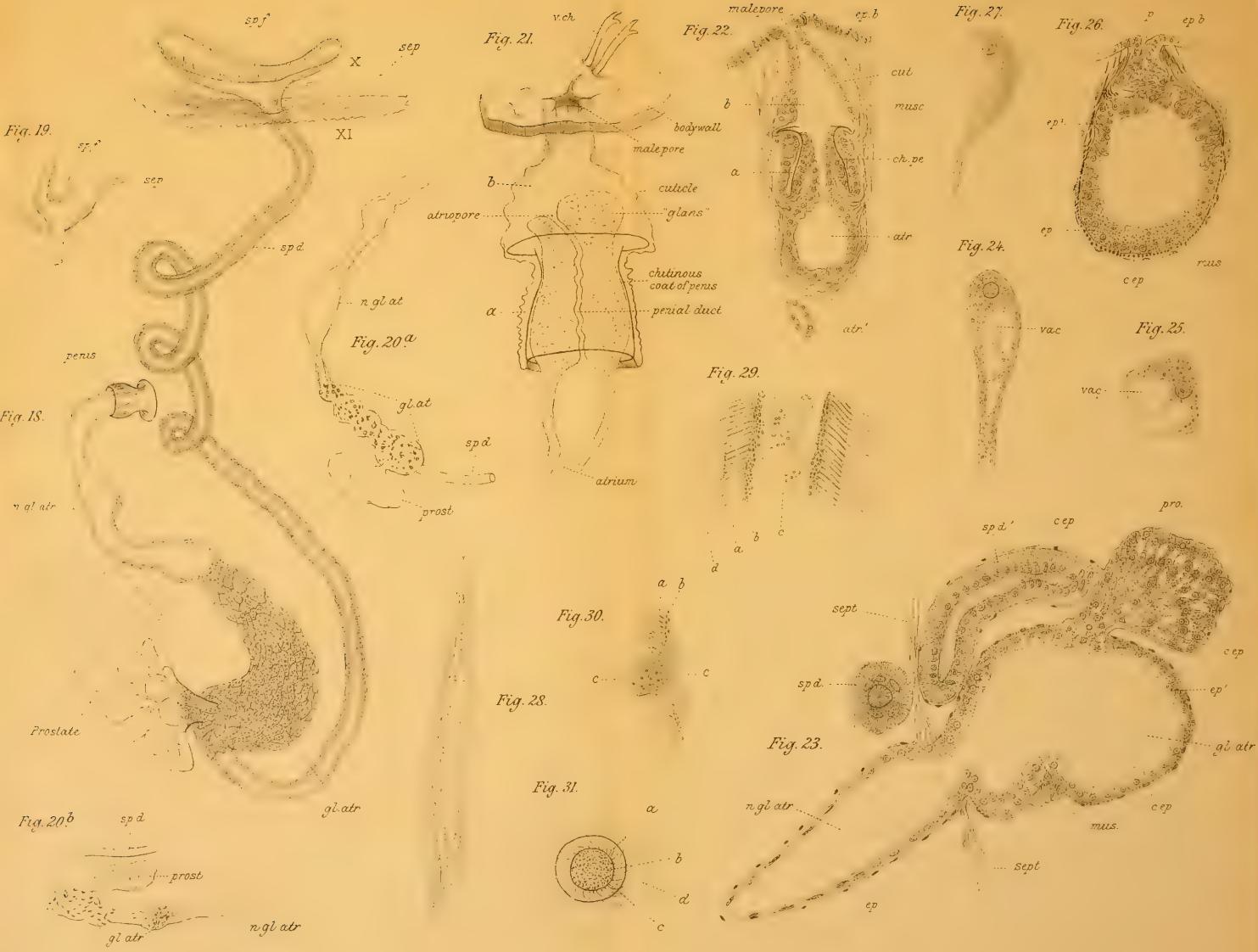




Fig. 38c

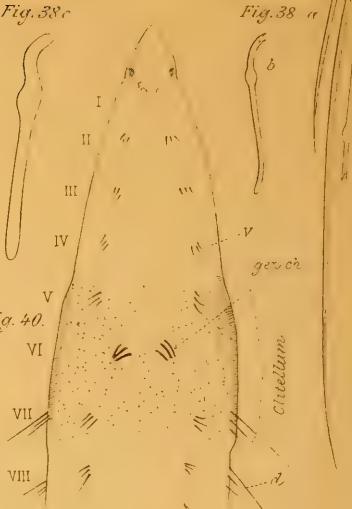


Fig. 34.

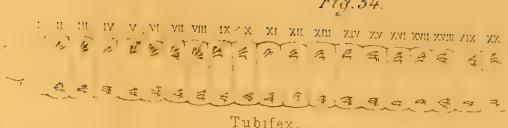


Fig. 38a

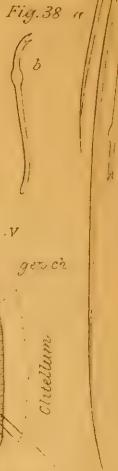


Fig. 40.



Fig. 41.



Fig. 44a



Fig. 43.

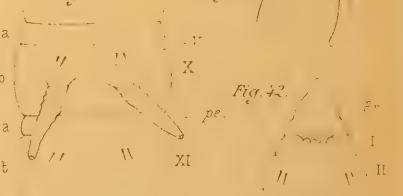


Fig. 44b



Fig. 42.

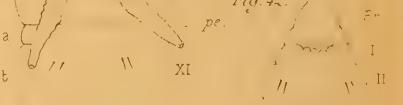


Fig. 36.



Hyodrilus perrieri & Spirosperma

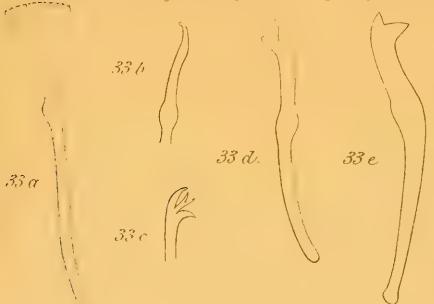


Fig. 35.



Limnodrilus, Chitellus, Hemitubifex

Fig. 33.



Psammoryctes.



a

b

c

d

e

f

g

h

i

j

k

l

m

n

o

p

q

r

s

t

u

v

w

x

y

z

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

hh

ii

jj

kk

ll

mm

nn

oo

pp

qq

rr

ss

tt

uu

vv

ww

xx

yy

zz

aa

bb

cc

dd

ee

ff

gg

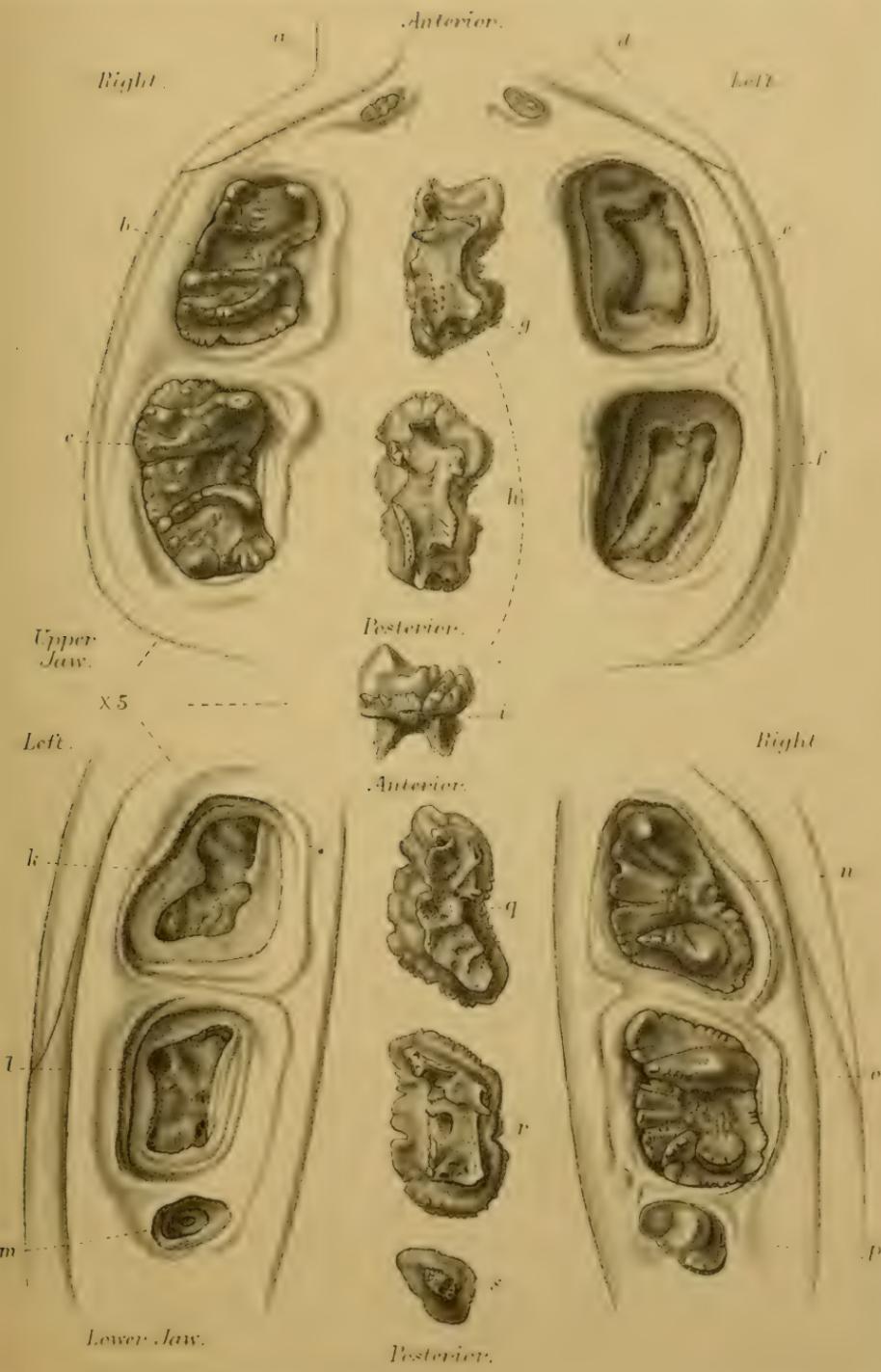
hh

ii

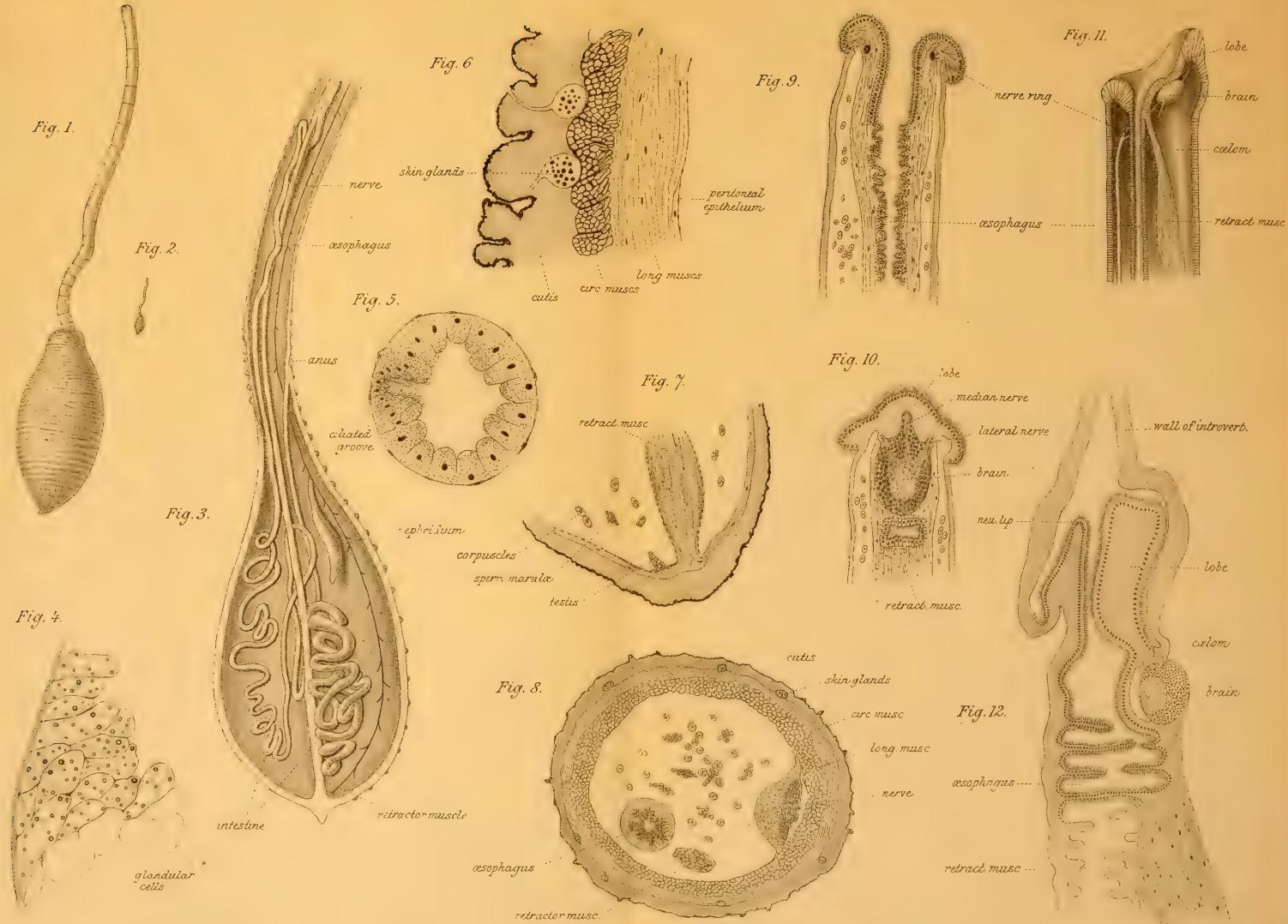
jj

kk

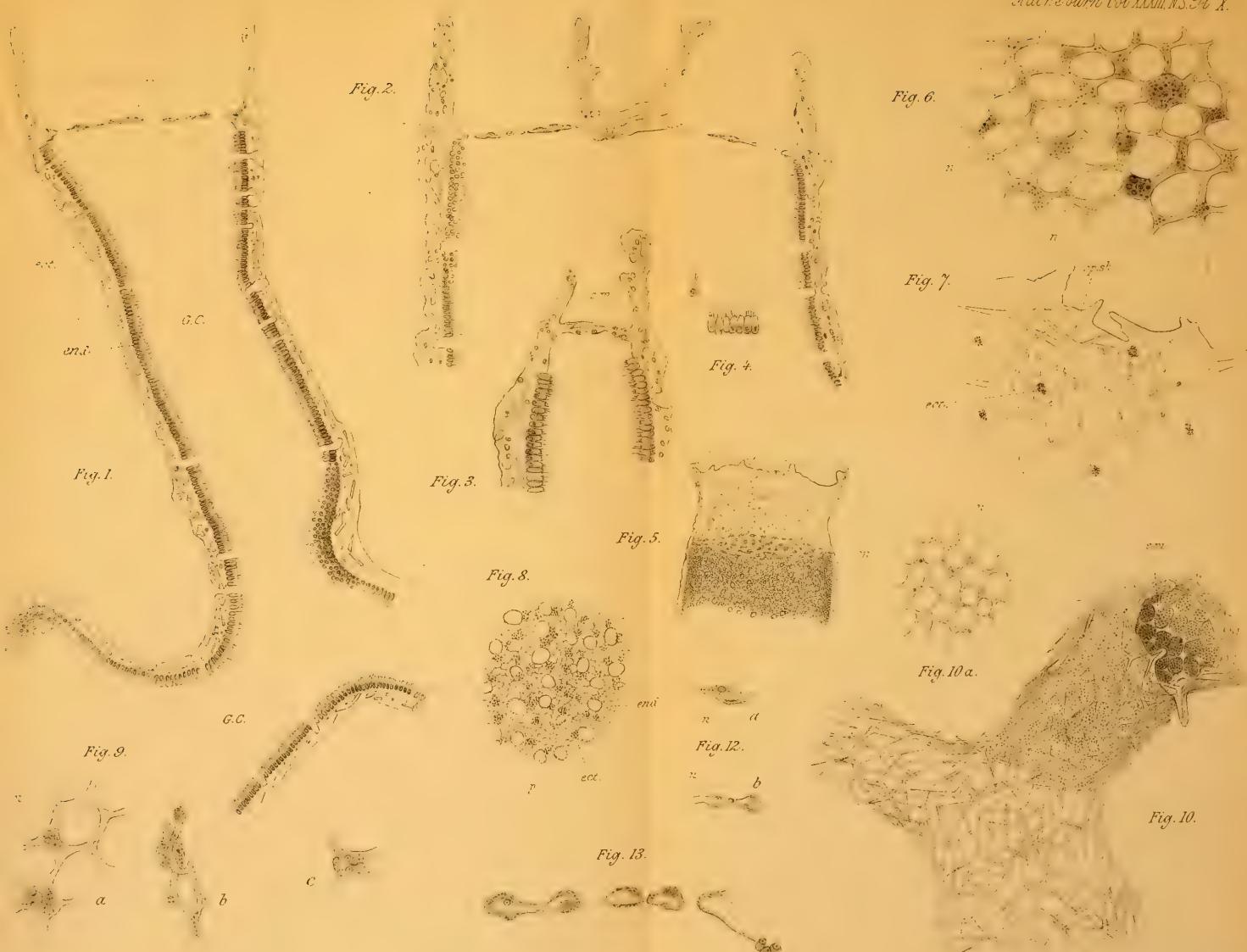














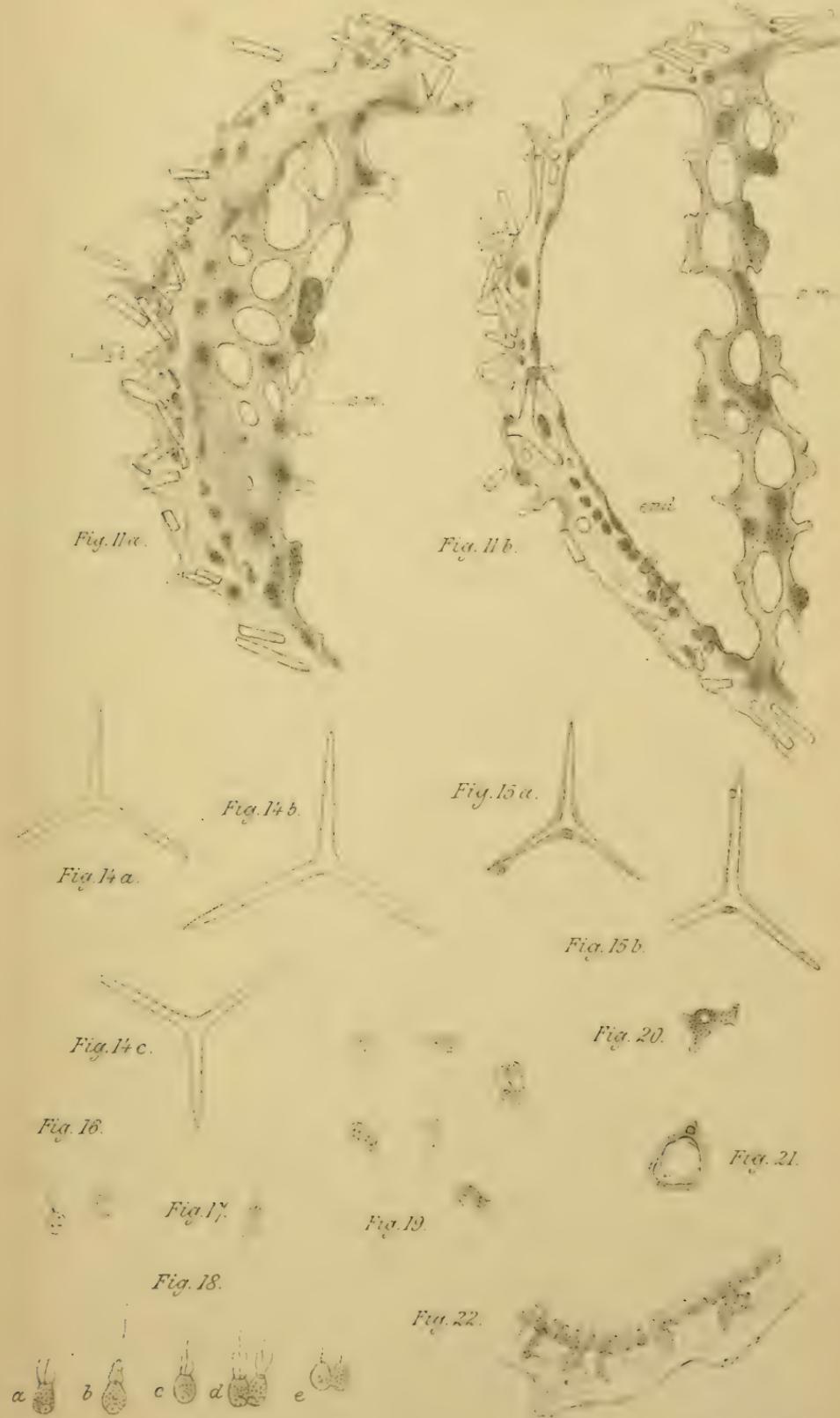




Fig. 1.

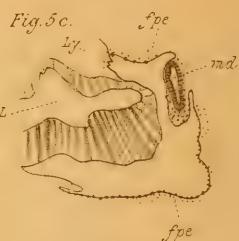
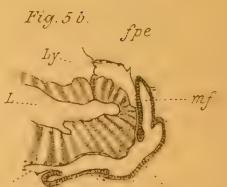
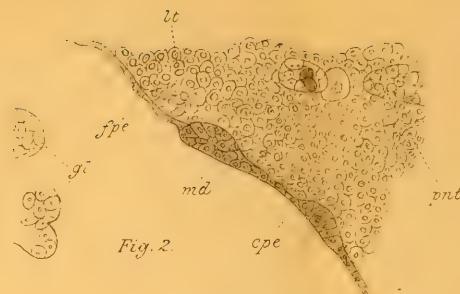


Fig. 4.

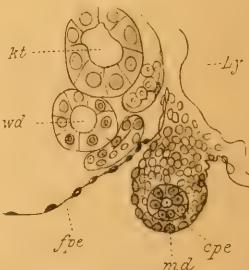
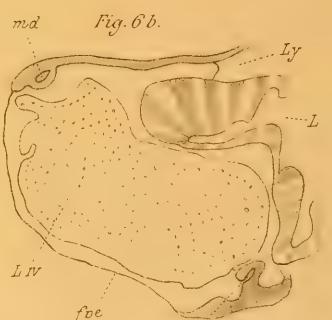
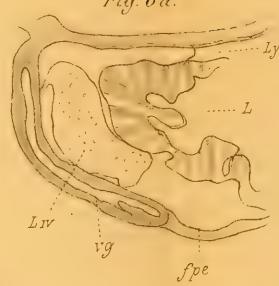
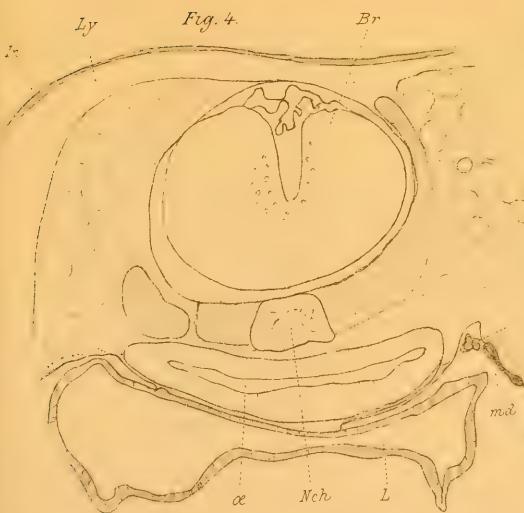


Fig. 7.



Fig. 8.



Fig. 9.

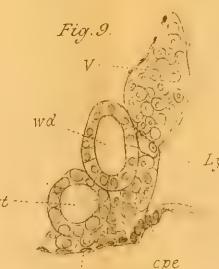


Fig. 10.

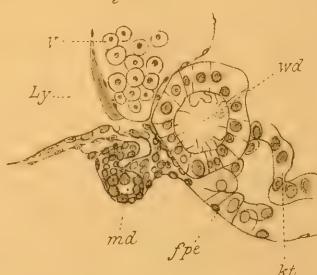


Fig. 11.

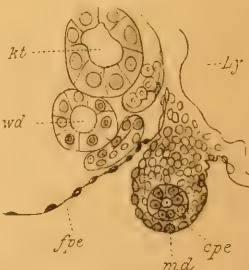




Fig. 12.

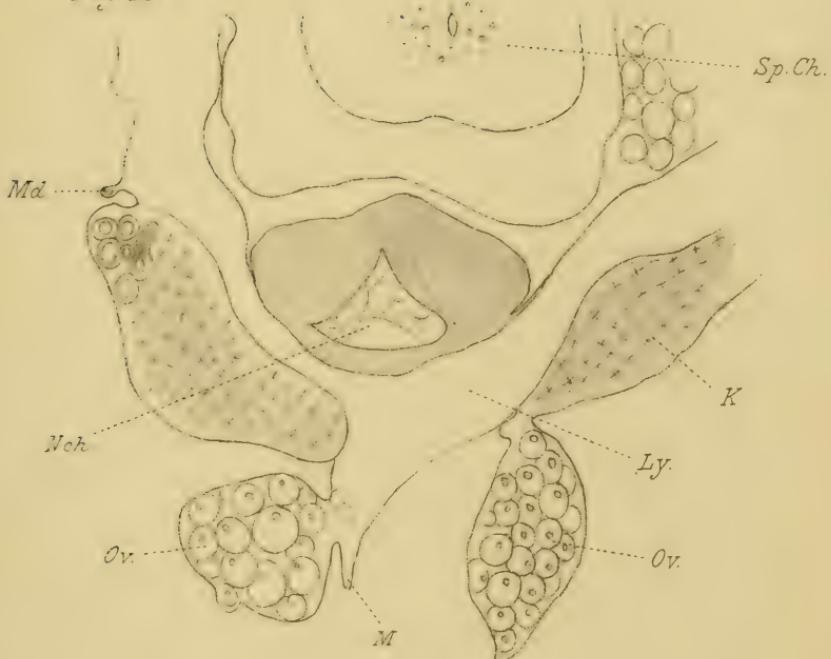


Fig. 14. *L Musc.*

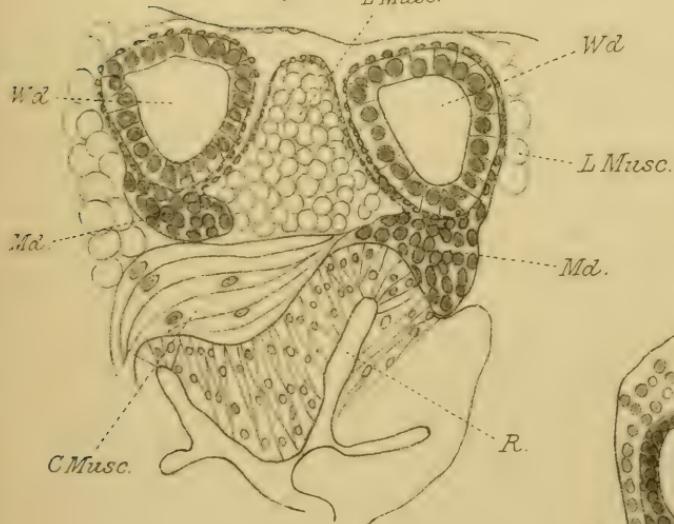


Fig. 13.

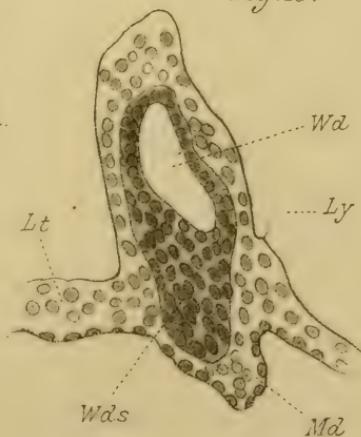




Fig. 1.

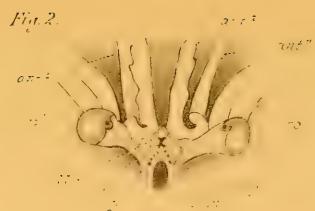


Fig. 5.

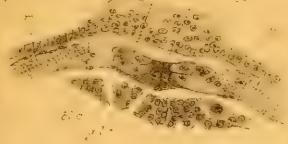


Fig. 4.



Fig. 8.

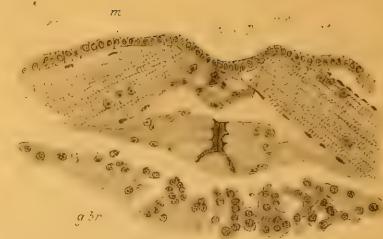


Fig. 9.



Fig. 10.



Fig. 12.

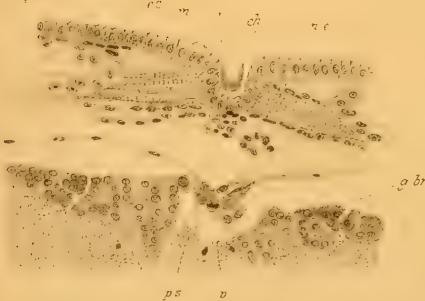


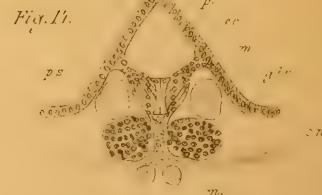
Fig. 13.



Fig. 11.



Fig. 14.





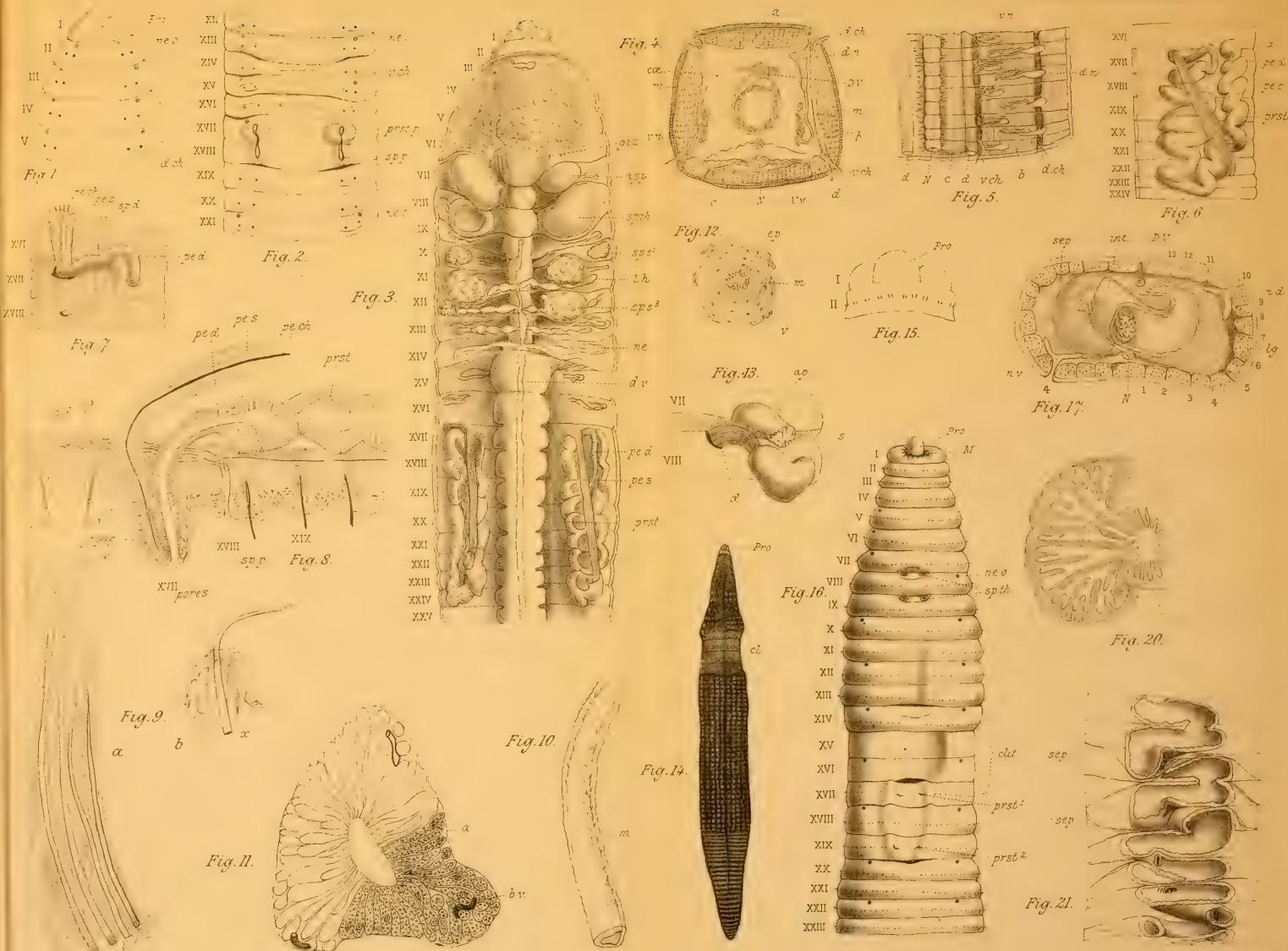












Fig. 1.

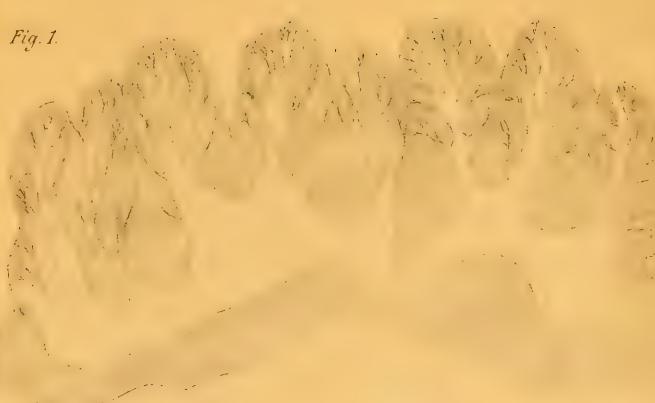


Fig. 2.

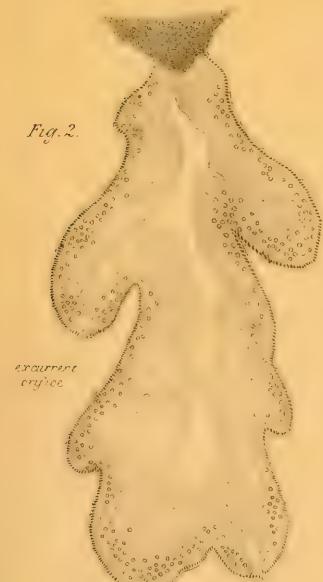


Fig. 4.

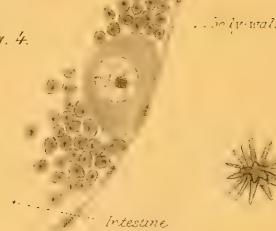


Fig. 3.



Fig. 6.

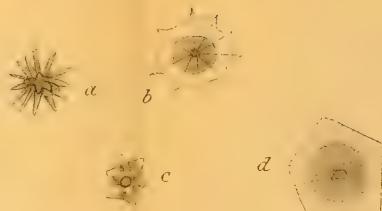


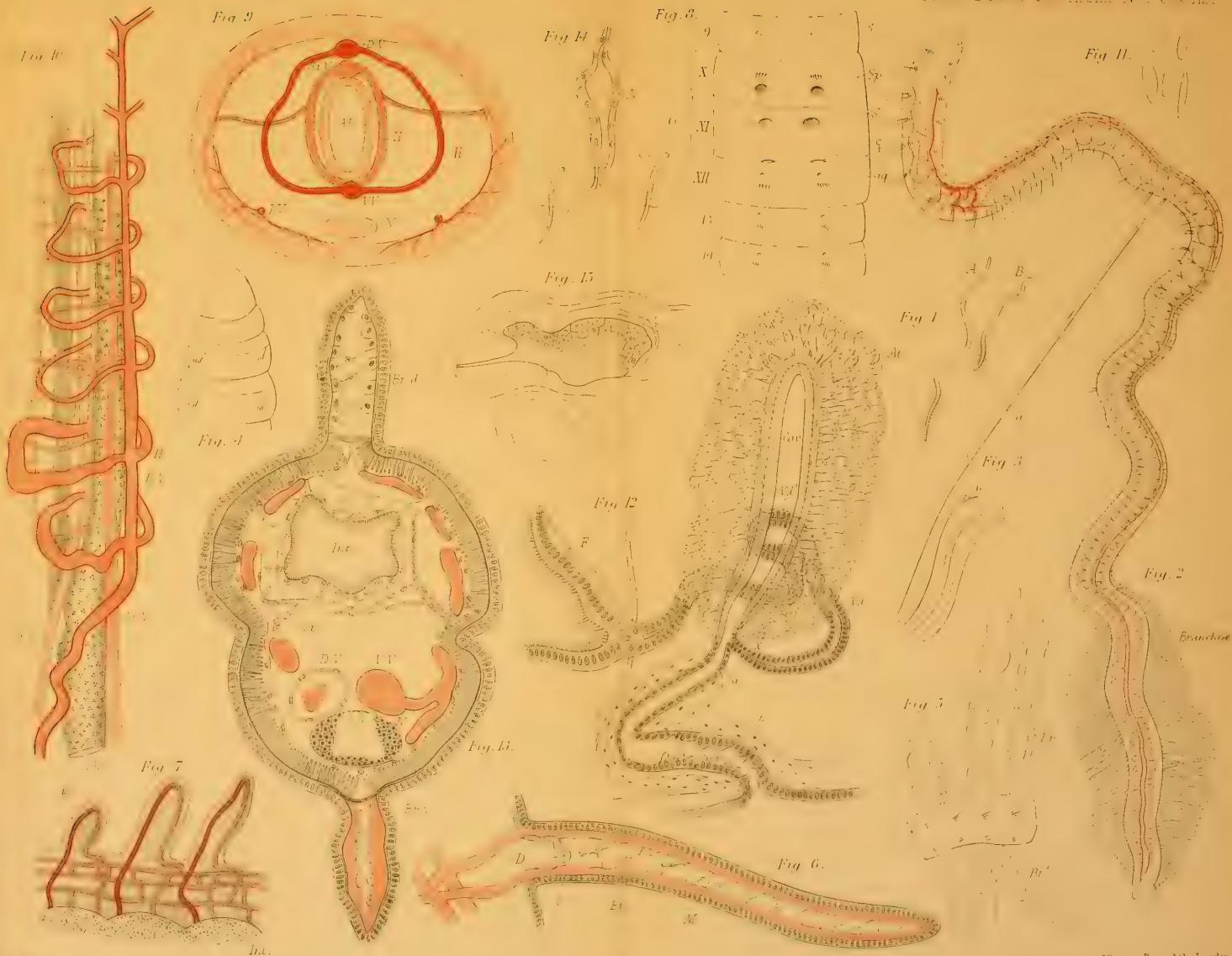
Fig. 5.



Fig. 7.









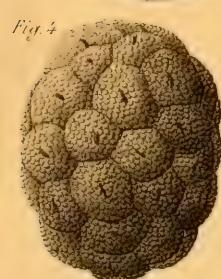
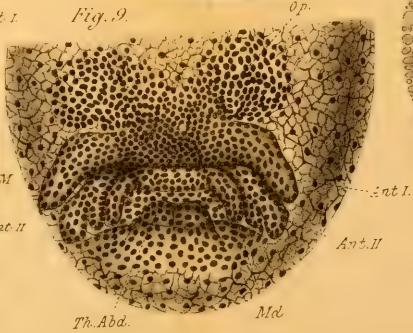
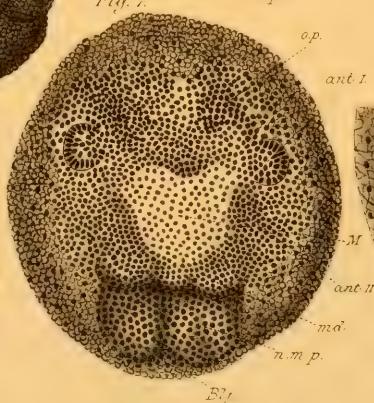
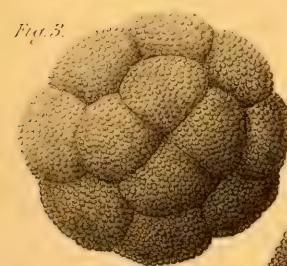
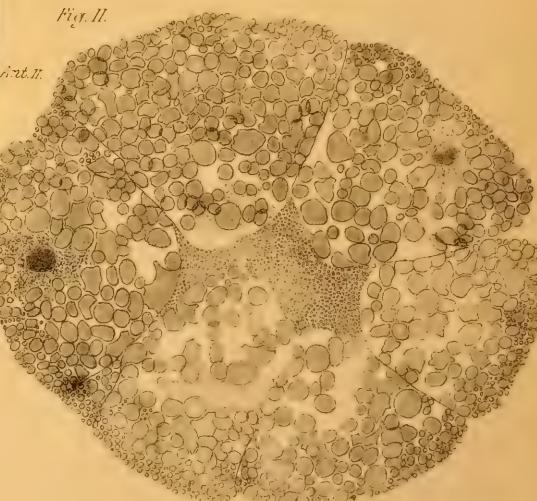
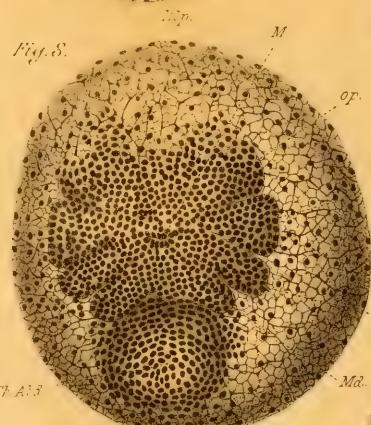
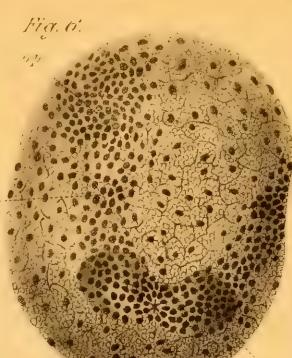
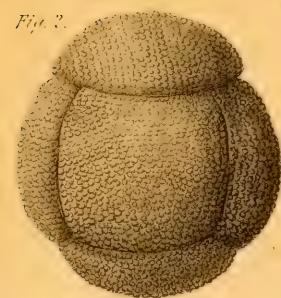
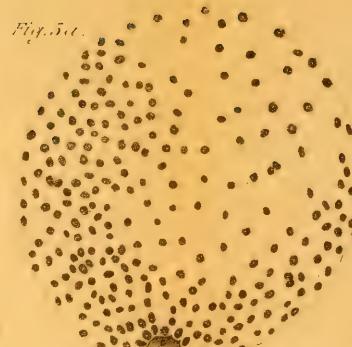
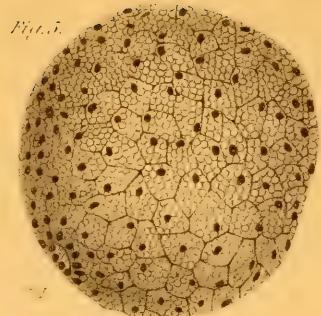
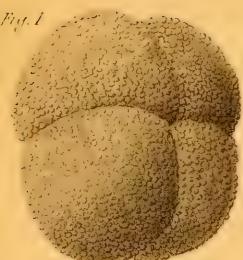




Fig. 12.

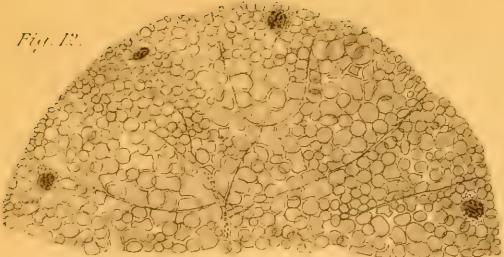


Fig. 13.

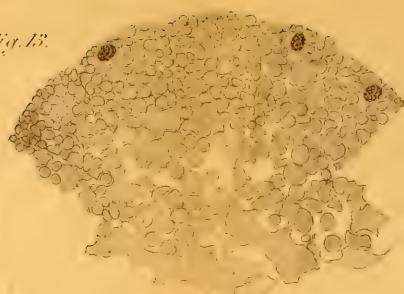


Fig. 14.



Fig. 15.



Fig. 18.



Fig. 16.

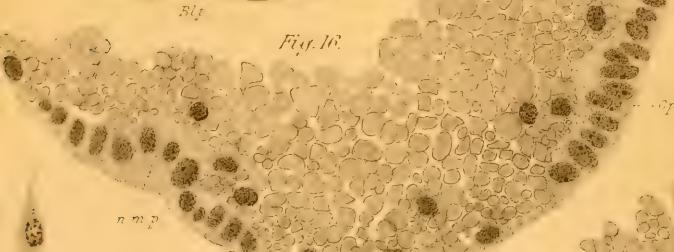


Fig. 20.



Fig. 21.



Fig. 19.

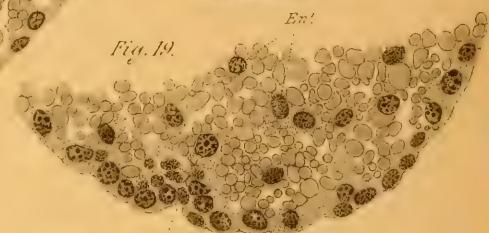


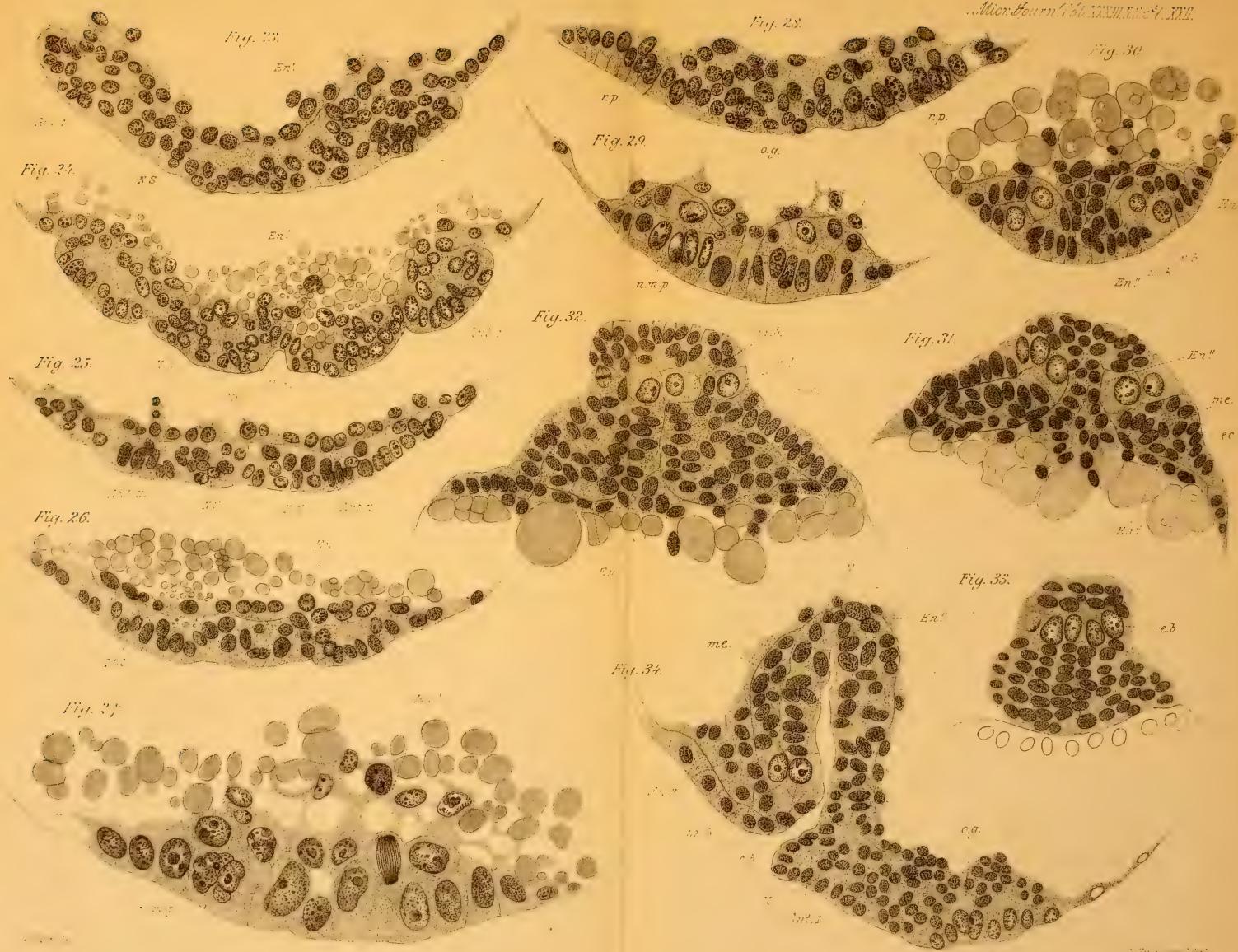
Fig. 22.



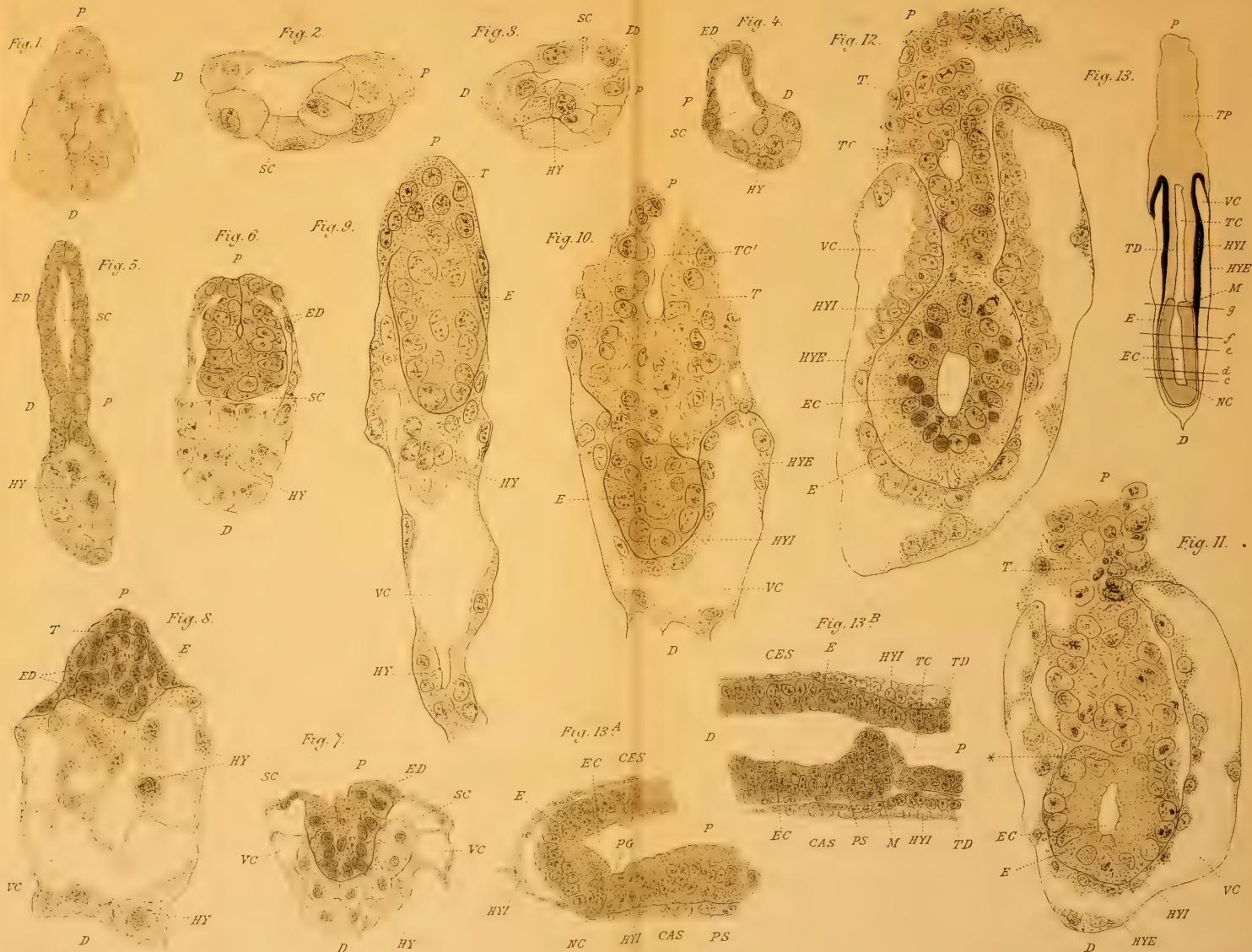
Fig. 17.







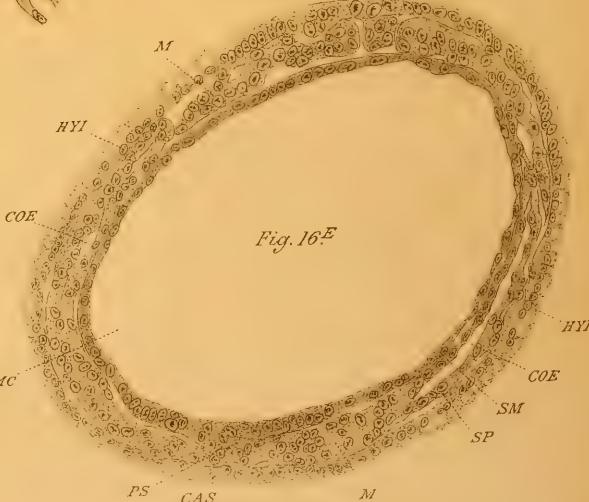
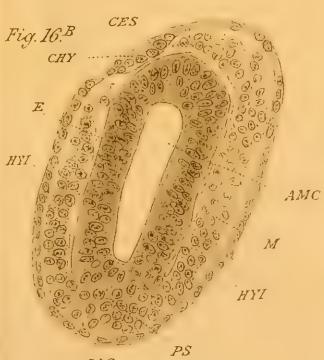
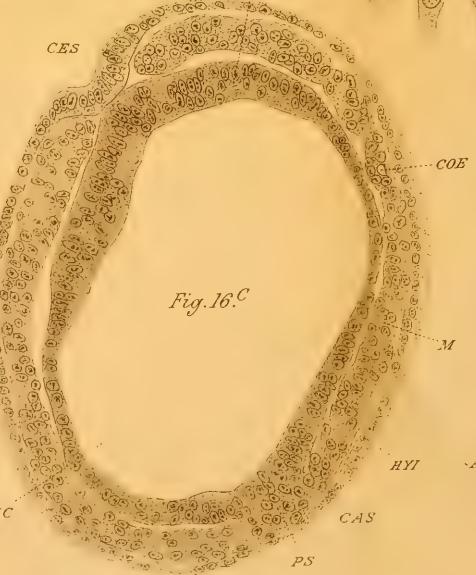
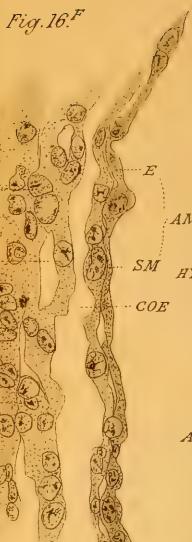
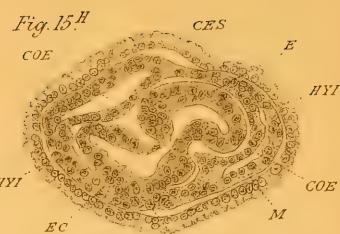
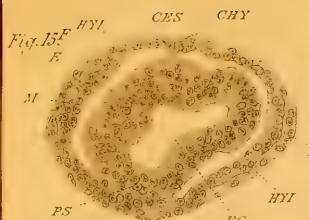




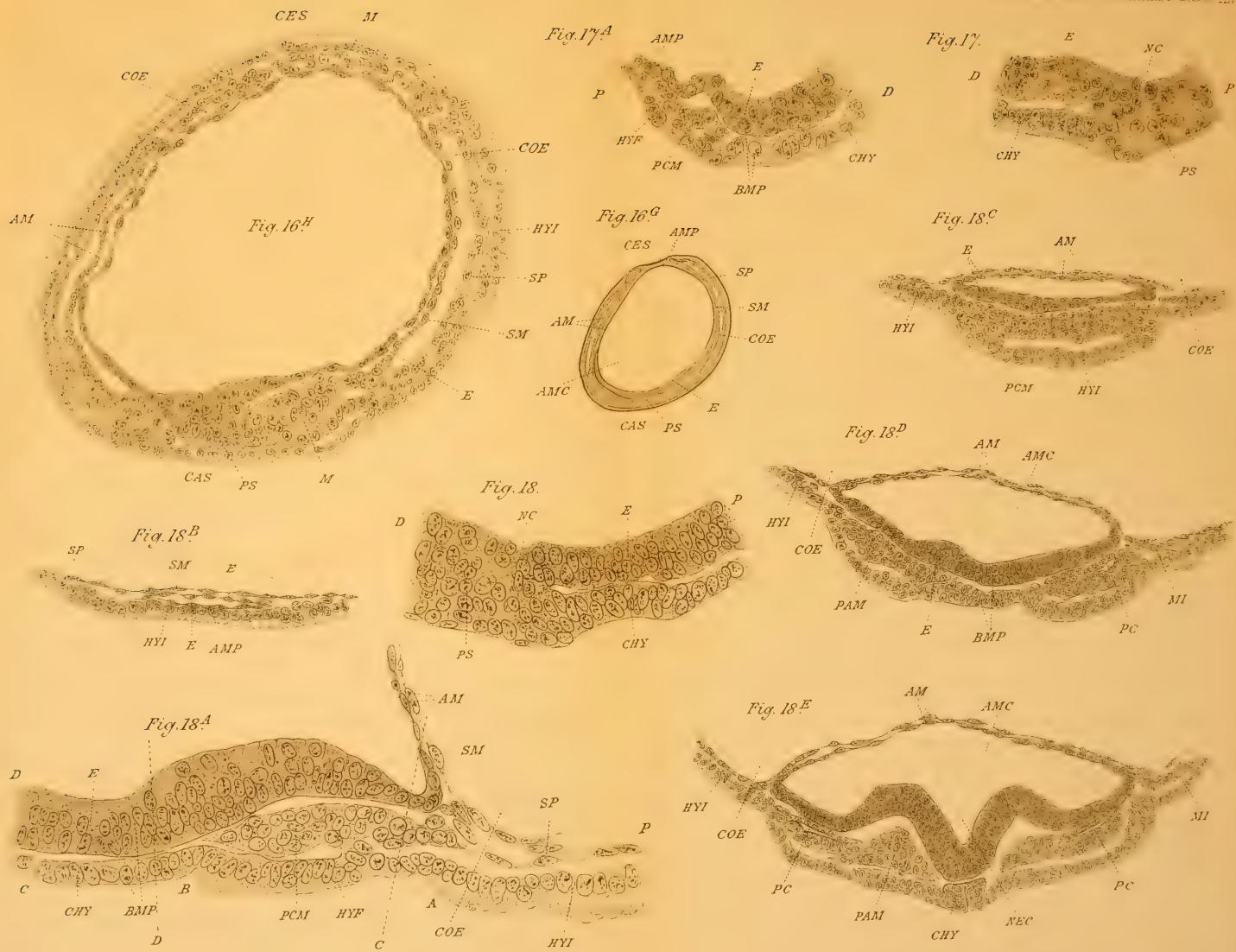














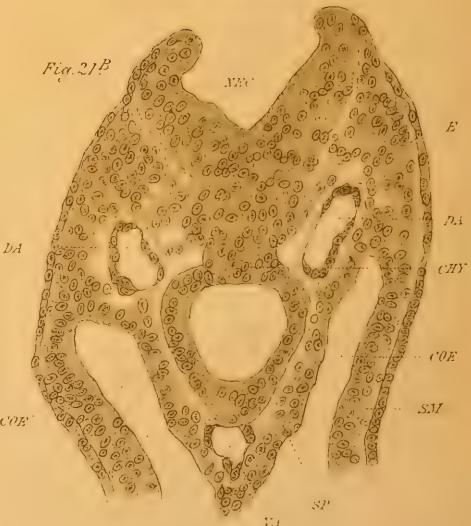
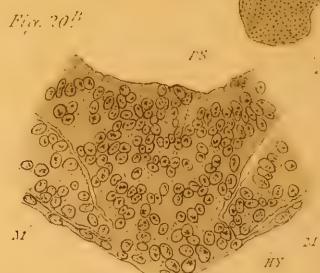
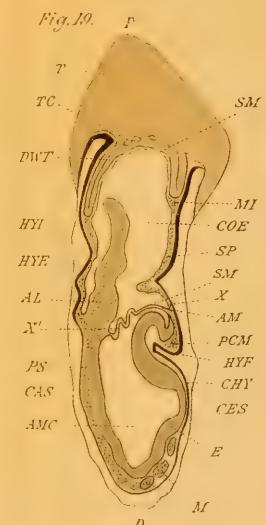
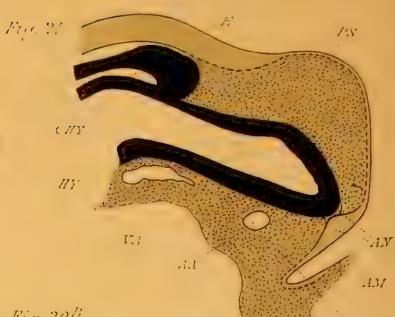
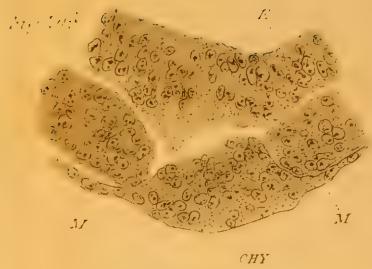
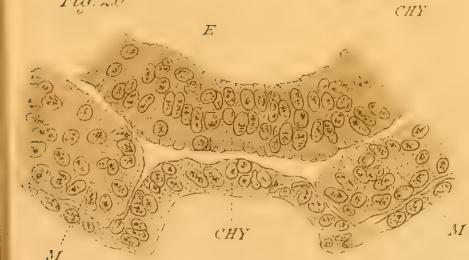
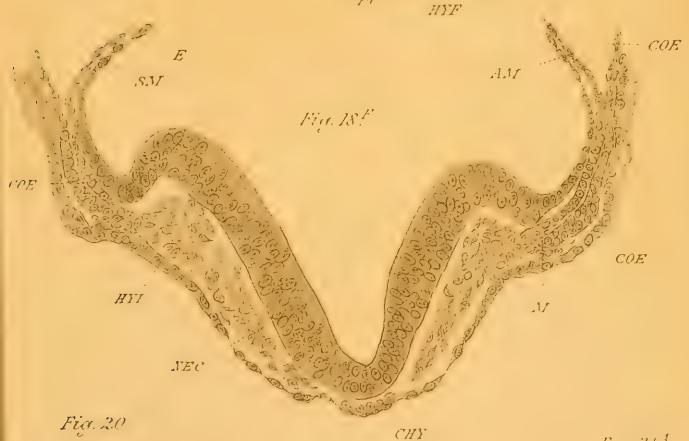
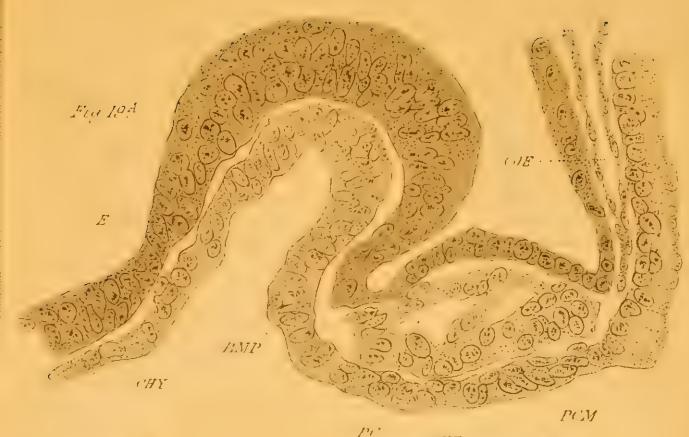




Fig. 1

cl.

Fig. 2

Fig. 4

Fig. 5

Fig. 6



Fig. 8.



Fig. 12.

Fig. 10.

Fig. 11.

Fig. 9

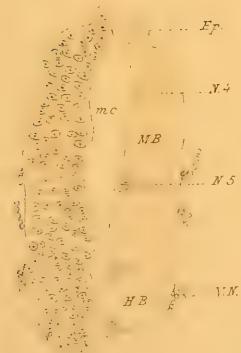






Fig. 1.



Fig. 2.

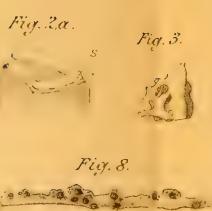


Fig. 3.



Fig. 4.  
x 5



Fig. 5.  
x 4



Fig. 6a.



Fig. 6b.

Fig. 6b.



Fig. 7a.

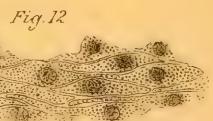


Fig. 12.

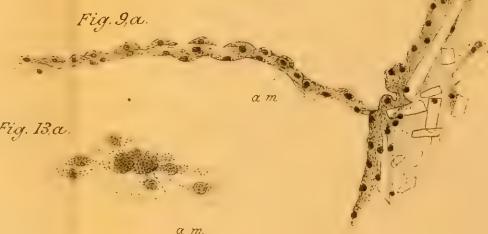


Fig. 9a.

Fig. 13a.

Fig. 6c.

Fig. 13b.



Fig. 15a.

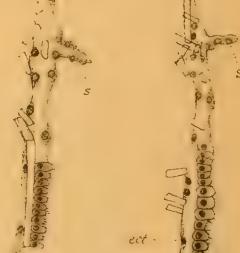


Fig. 6d.

Fig. 15b.



Fig. 15c.

Fig. 6a.



Fig. 10.



Fig. 11.

Fig. 14.

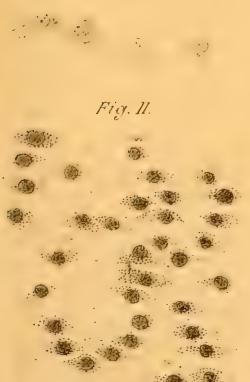


Fig. 12.



Fig. 13.

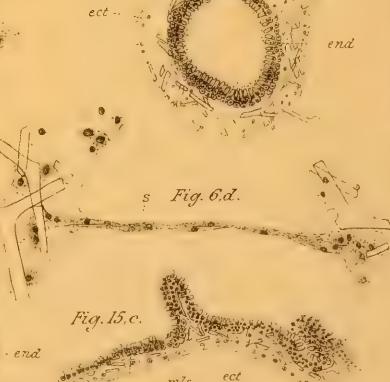


Fig. 14.



Fig. 15.







Fig. 11.



Fig. 20.



Fig. 23.



Fig. 19.



Fig. 13.



Fig. 12.



Fig. 18.



Fig. 14.



Fig. 15.

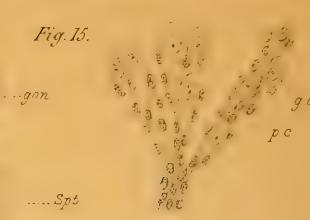


Fig. 21.



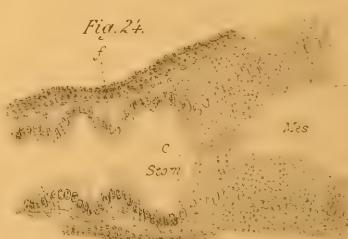
Fig. 22.



Fig. 17.



Fig. 24.





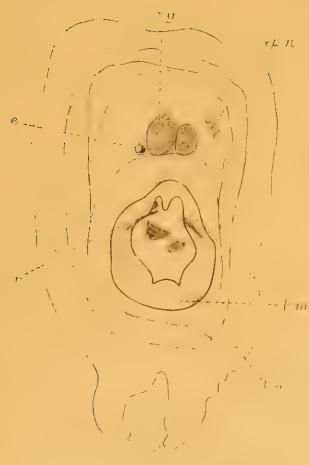


Fig. 1.

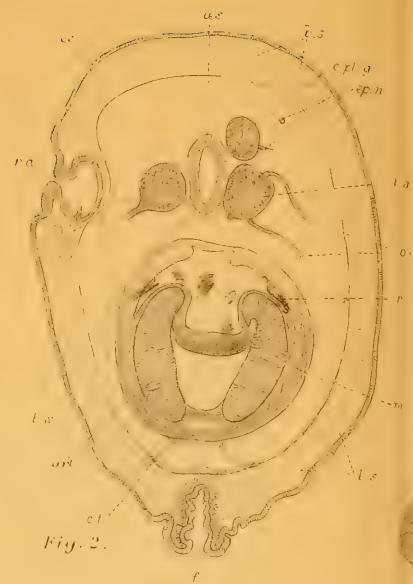


Fig. 2.



Fig. 4.

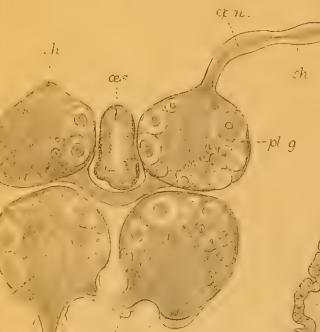


Fig. 6.



Fig. 9.

ANATOMICAL DRAWINGS OF THE LARVAE OF THE NEMERTINES

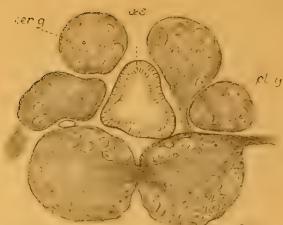


Fig. 5.

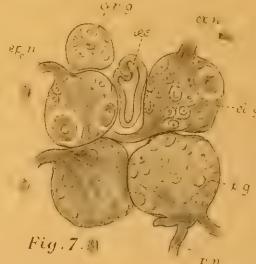


Fig. 7.

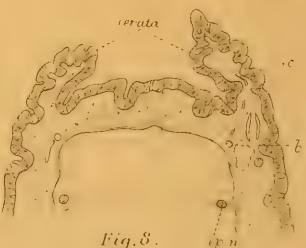


Fig. 8.



Fig. 3.



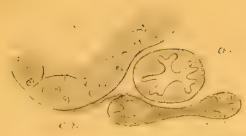


Fig. 10.



Fig. 11.



Fig. 12.

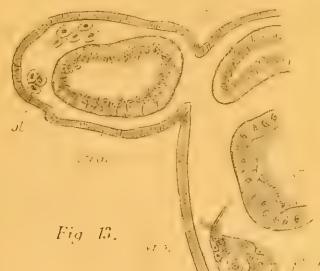


Fig. 13.

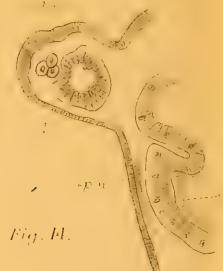


Fig. 14.



Fig. 15.

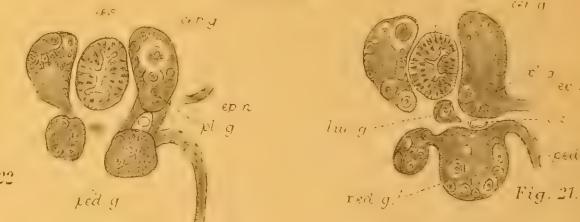


Fig. 16.

Fig. 17.



Fig. 17.



Fig. 18.

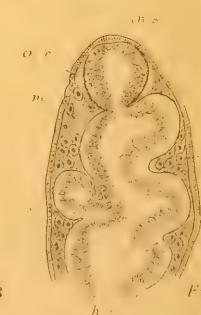


Fig. 19.



Fig. 20.



Fig. 21.

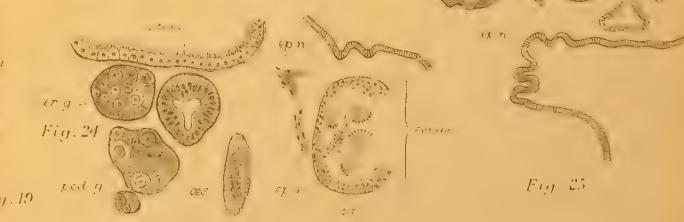


Fig. 22.

Fig. 23.



Fig. 23.



Fig. 24.

Fig. 25.



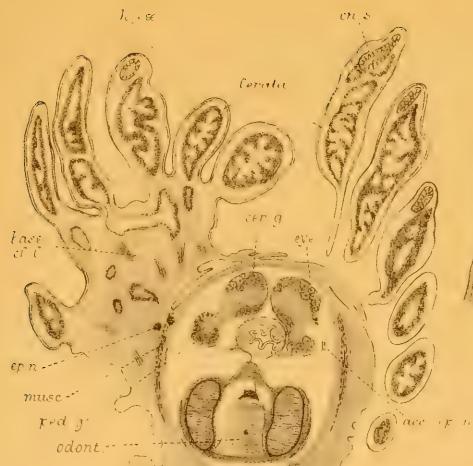


Fig. 28.

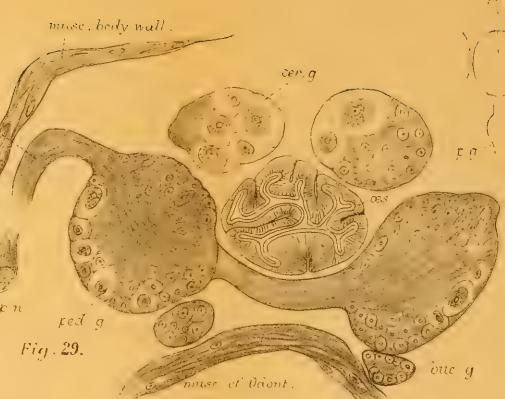


Fig. 29.

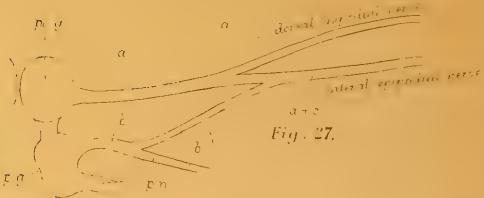


Fig. 27.

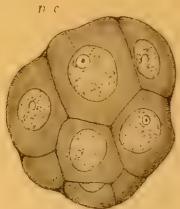


Fig. 30.



Fig. 31.

Fig. 32.



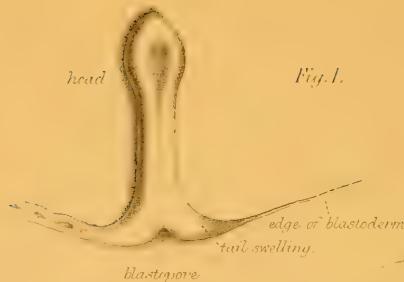


Fig. 1.



Fig. 7.

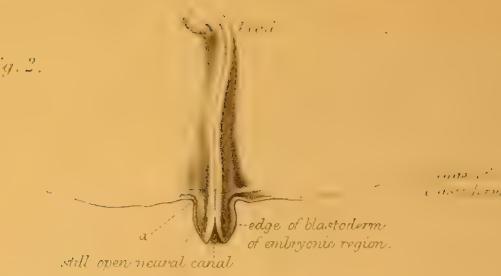


FIG. 2.

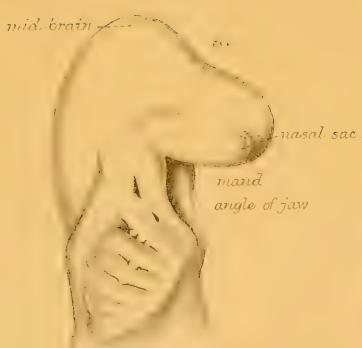


Fig. 9.

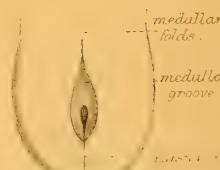


Fig. 1.

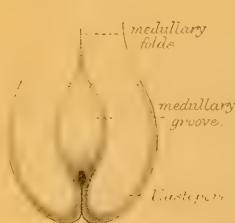


Fig. 3



FIG. II



Fig. 5.



Fig. 6.



Fig. 8.



Fig. 10.

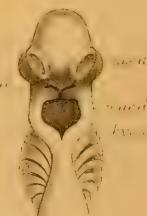


Fig. 12.



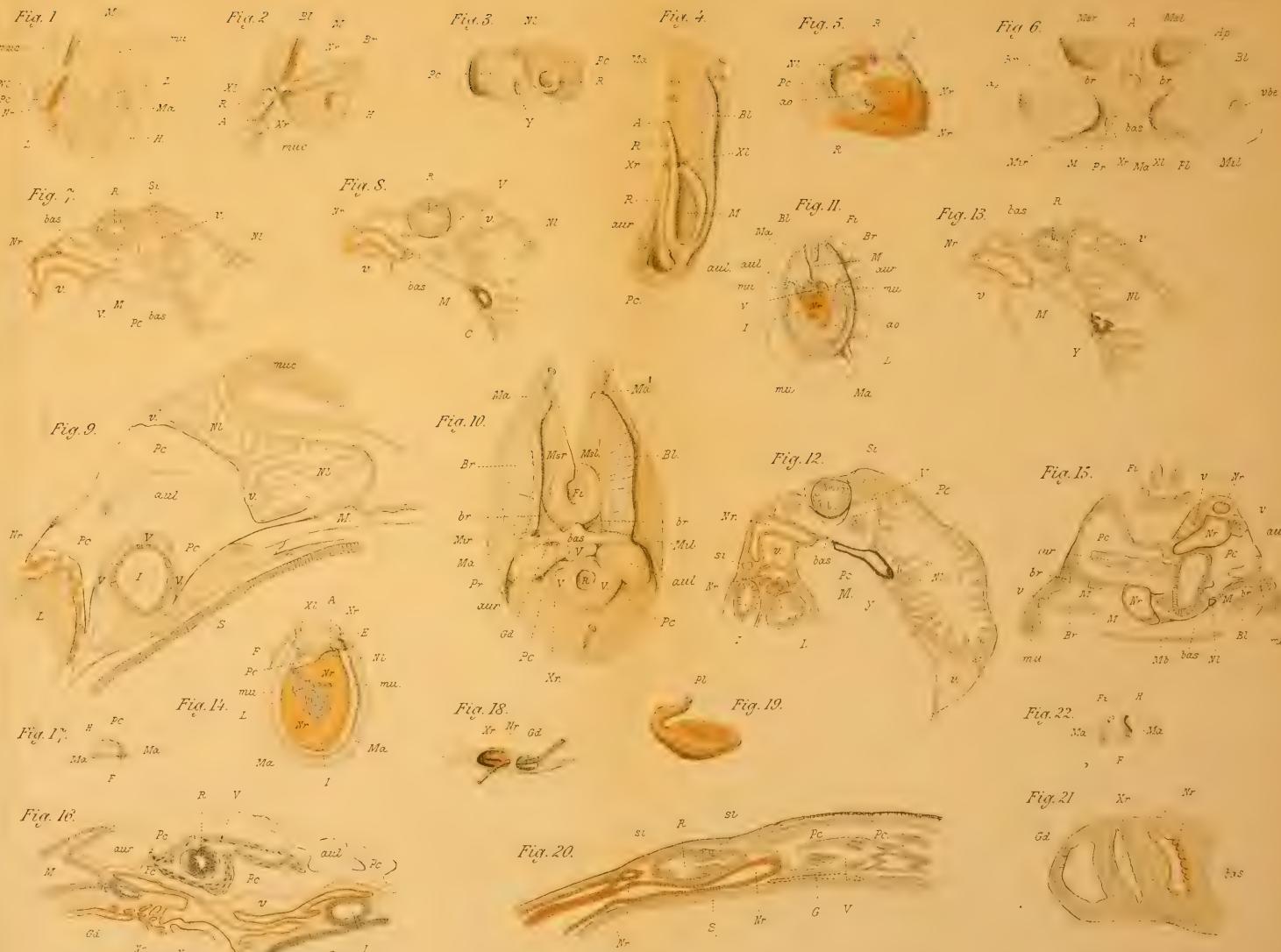






Fig. 24



Fig. 23.

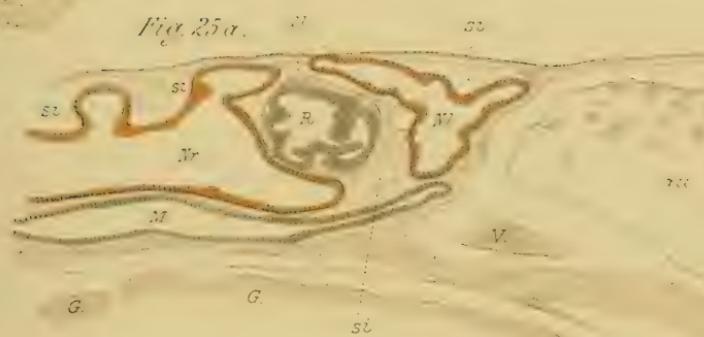


Fig. 25b.

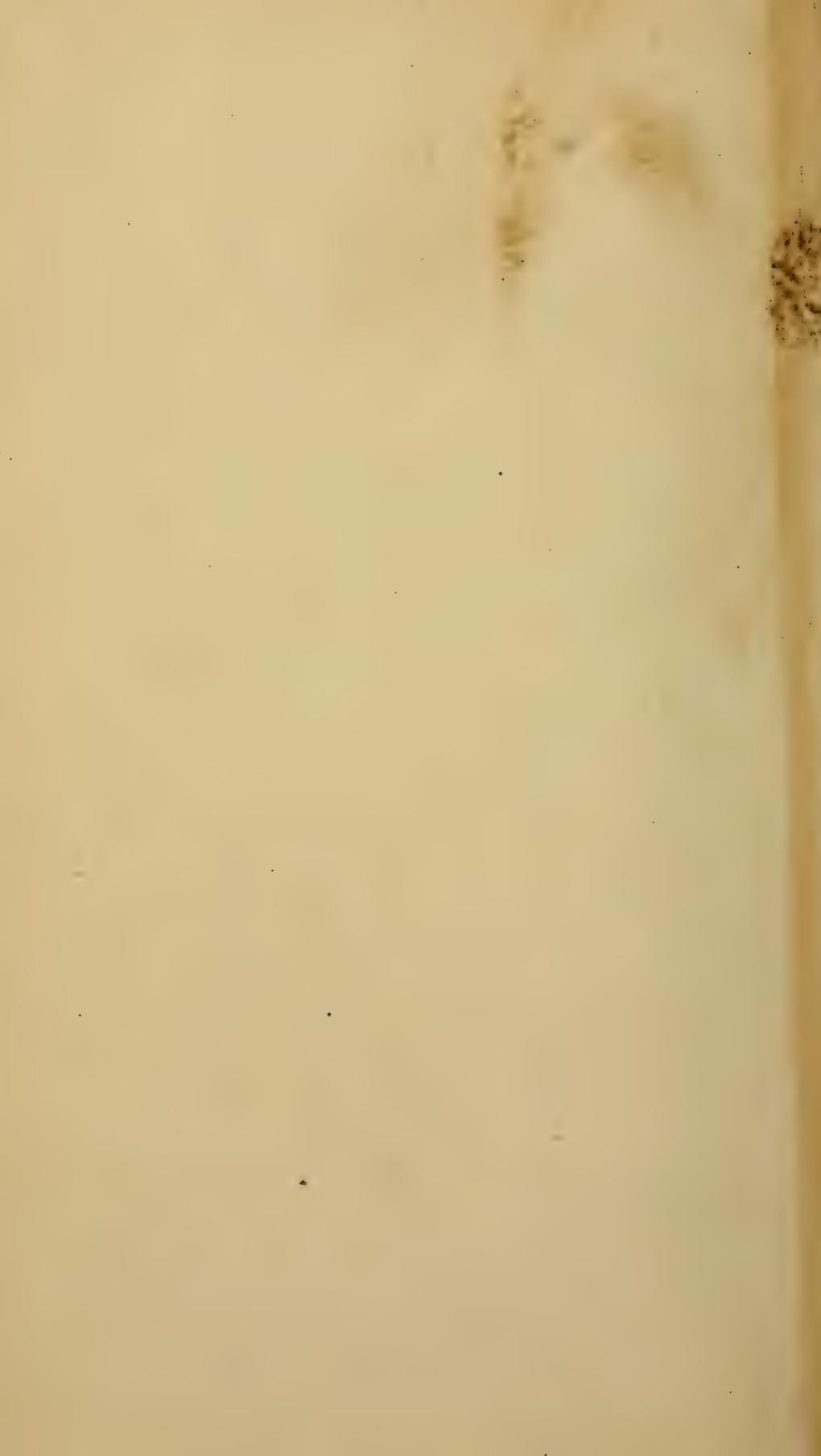


Fig. 26.



Fig. 27.









ERNST MAYR LIBRARY



3 2044 110 319 761

